EHS/MSD 26/24

Environment, Safety and Health For Managers, Supervisors, Principal Investigators and Mentors of Students

Materials Sciences Division

Why Are You Here?

- Given: Safety is as important as science
- DOE is serious about EH&S:
  - "…the first dollar we send to the labs is the dollar that is to be used for safety. This is not hyperbole. We mean it."

    Pat Dehmer, Associate Director of Science for Basic Energy Sciences, December, 2005

Accidents Cost Money

- **LBNL FY'04 Total Worker Compensation Cost**
  - $1.5 million
- **Ergonomic Claims**
  - $35K/claim (FY '04)

Your research dollars pays these cost through overhead!

Course Objectives

- Review the Integrated Safety Management (ISM) philosophy at LBNL
- Describe the ES&H roles and responsibilities of Line Management at LBNL and within MSD
- Overview of EH&S tools and resources

Integrated Safety Management (ISM) Essentials

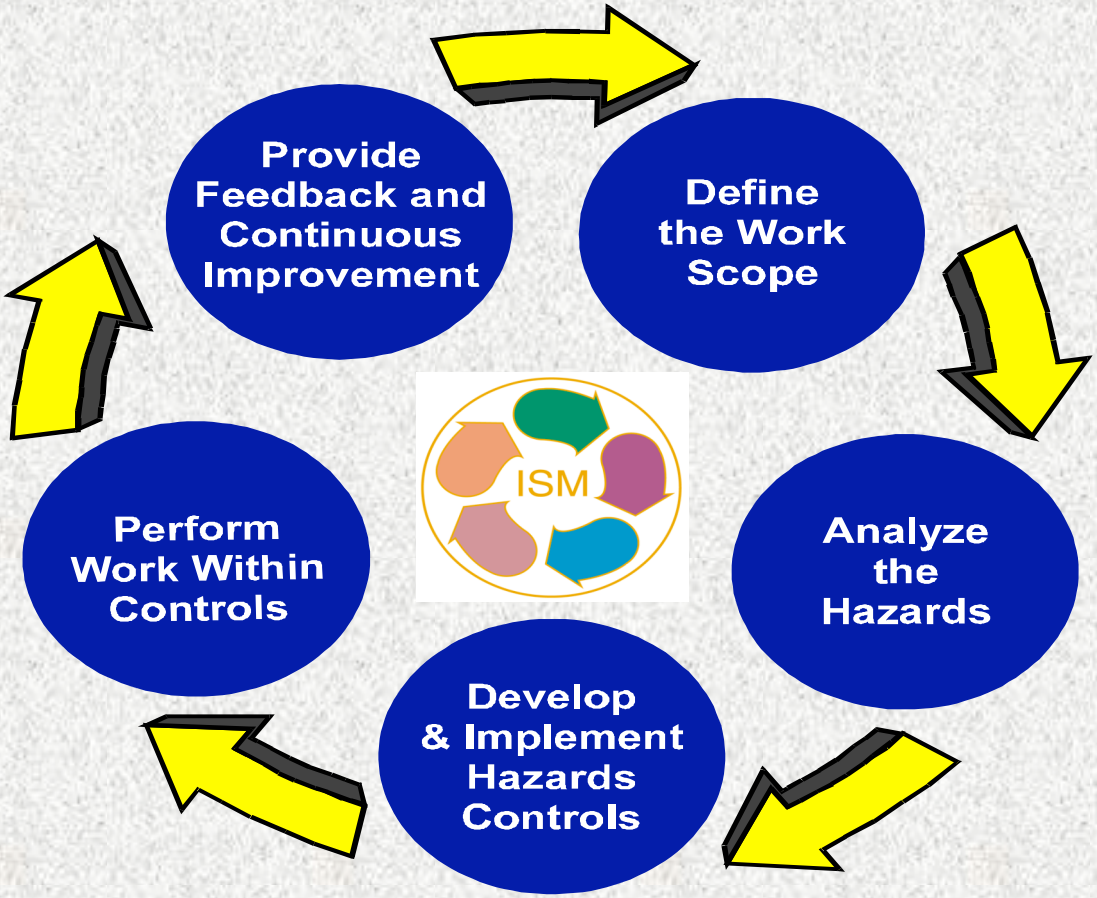
DOE Contract clause mandates the implementation of ISM: "Integrate safety into daily activities!"

- **Seven Guiding Principles:**

1. Line management is responsible and accountable for ES&H
2. Clear roles and responsibilities for implementation of ES&H
3. Staff and student training consistent with responsibilities
4. Balanced priorities: safety and research
5. Identification of ES&H standards and requirements
6. Establishment of hazard controls
7. Appropriate authorization of work

Integrated Safety Management (ISM)

Line management authority and accountability for EH&S



You are responsible for the safety of your students, post-docs, staff, users and all of your visitors and guests!

Supervisors' Role in Implementing ISM

1. Communicate safety expectation to your group
2. Ensure that group members complete required safety training
3. Designate a group safety representative
4. Personally perform workspace inspections
5. Ensure use of engineered controls and protective equipment
6. Manage ergonomic hazards
7. Properly store and accumulate hazardous waste
8. Obtain and maintain formal work authorizations
9. Implement tracking of your laboratory chemicals
10. Resolve EH&S issues promptly
11. Report all incidents and near misses
12. Be a positive role model and establishing a strong "safety culture" in your labs and other workplaces

1) Communicate Safety Expectation

- Alert your employees to safety expectations to which they are held
- Include safety expectations in performance review.
- Share lessons learned and near misses
- Review observed positive safety behaviors
- Document safety discussions (meeting minutes)
- Establish a laboratory safety notebook system to aid in communication and recordkeeping

Rick Kelly can help you set up your group safety communication system!

2) Ensure Training Completion

- Update employee Job Hazard Questionnaire (JHQ) when work changes or annually
- Review training profile with employee
- Verify that students and employees have completed training (*including lab users whom you do not supervise*)
- Conduct and document On the Job Training (OJT)

Many of the common EH&S classes are available on the internet.

3) Designate a Group Safety Representative

Each MSD research group must have a designated Group Safety Representative and a more junior backup:

- Serves on the MSD Safety Committee (*must attend* all meetings or send a backup)
- Point of contact for EH&S issues within the group
- Presents information from Safety Committee at group meetings
- Brings safety questions from group back to the MSD Safety Committee

4) Conduct Inspections

Personally conduct workspace inspections at least quarterly:

- Use the Walk Around Inspection Checklists
- Observe work processes
- Recognize good work practices
- Make all corrections promptly
- Report findings that you can not immediately correct to Rick Kelly (these items will be tracked in CATS)
- Document your inspection
- Ask for help with inspections:
  - Rick Kelly (EH&S Manager/DSC)
  - Jim Severns (electrical safety)
  - Paul Johnson (EH&S Technician)
  - John Seabury (EH&S Liaison)
  - Howard Hansen (Waste Management)

Available Training:

EHS0027: Performing an Effective Safety Walkaround

5a) Use Engineered Controls Effectively

Ensure that engineered controls are functioning properly and used correctly:

- Fume hoods: Check flow monitor, should be ~110 ft/m
- Glove boxes: Check pressure gauges
- Adjustable computer work stations
- Safety shower and eyewash: Check testing tag
- Electrical disconnects: Not obstructed
- Run/safe lights and interlocks: Demonstrate that these are operational

5b) Personal Protective Equipment

Manage the use of personal protective equipment:

- Choose equipment with care (gloves, respirators, safety glasses, face shields, lab coats,etc.)
- Ensure employees know how to use equipment properly

  (e.g. for respirator use, goggles vs. face shield)
- Establish a process to inspect and replace worn or damaged equipment
- Properly store equipment when not in use

Available Training:

EHS 348 Chemical Hygiene Safety

EHS 310 Respirator Training

6) Ergonomics

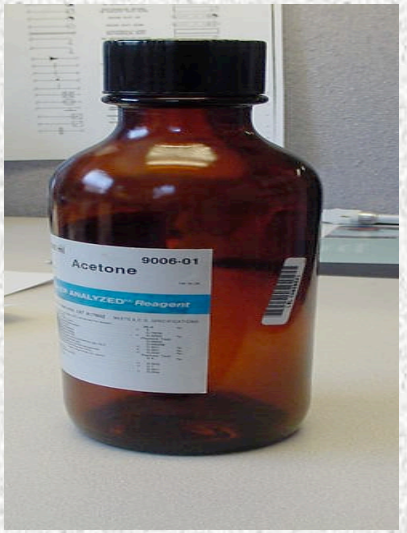
- Training is required for those working at computers more than 4 hours/day
  (EHS 60 Ergonomic for Computer User)
- Ergonomic Evaluation recommended (EHS 68 Ergonomic Evaluation)
- Implement Ergonomic Evaluation Recommendations
- Close out ergonomic evaluation in the ERGO Database

Available Training:

EHS 60 Ergonomic for Computer User
EHS 22 Ergonomics for Supervisors

7) Properly Store and Accumulate Waste

- Properly label all waste containers
- MSD 6 month administrative limit for storage of waste in a SAA
- Do not overfill waste containers
- Do not let students/post docs leave without transferring or disposing of all chemicals!
- Designate a primary and more junior backup SAA manager
- Replace departing SAA managers *before* they leave!



Available Training:

EHS 604 Hazardous Waste Generator

EHS 622 Radioactive Mixed Waste Generator

EHS 610 Waste Accumulation

EHS 614 Satellite Accumulation Areas Management

Contact Paul Johnson (x5810) for help with hazardous waste issues

8) Chemical Management System

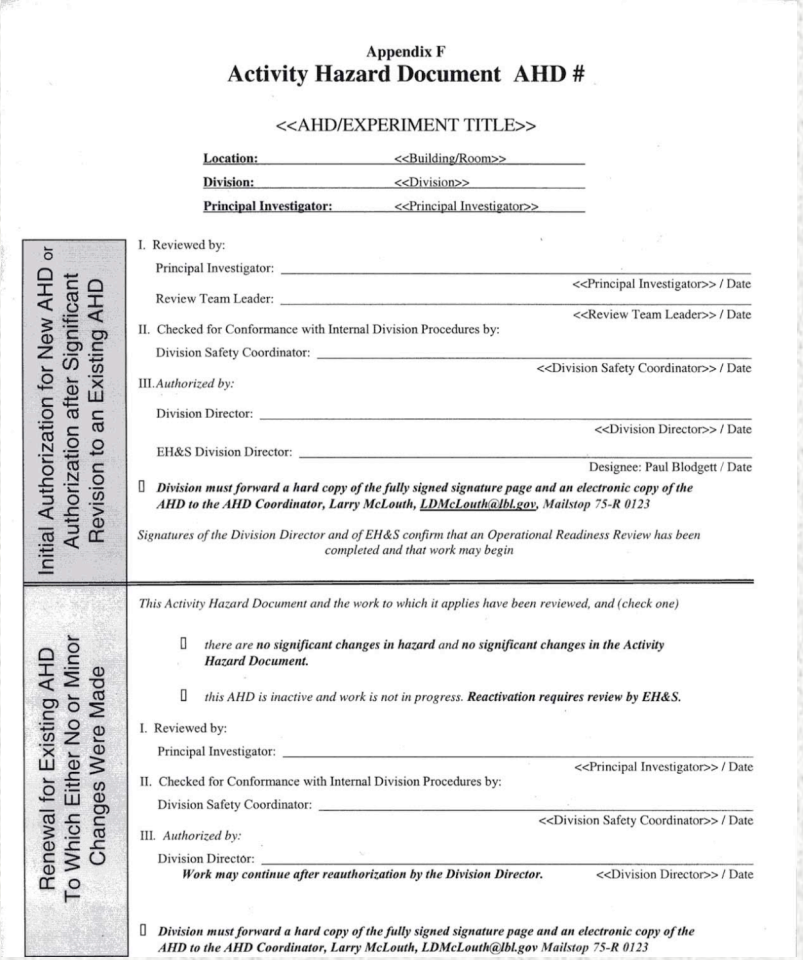
- **Name a "chemical management" lead for your group to verify:**
  - Bar code is attached to chemical containers when delivered
  - Chemical information is entered into database
  - Empty containers are deleted from database

Available Training: EHS 346 Chemical Management System

A briefing is available from Paul Johnson (x5810). Paul can also provide forms and bar code labels, as well as direct assistance.

9) Obtain & Maintain Formal Authorizations

- **Many types of work require formal review and authorization or permits. Examples of formal authorizations/permits include:**
  - Activity Hazard Document (AHDs)
  - Biological Use Authorization (BUA)
  - Vertebrate animal research approval
  - Human Subjects Committee approval
  - Radiological Work Authorization (RWA)
  - Radiological Work Permit (RWP)
  - Sealed Source Authorization (SSA)
  - X-ray Authorization (XA)
- Pub3000, Chapter 6 Appendix D (Safe Work Authorizations) is best reference



Appendix F

Activity Hazard Document AHD #

<<AHD/EXPERIMENT TITLE>>

Location: <<Building/Room>>

Division: <<Division>>

Principal Investigator: <<Principal Investigator>>

Initial Authorization for New AHD or Authorization after Significant Revision to an Existing AHD

I. Reviewed by:

Principal Investigator: _____ <<Principal Investigator>> / Date

Review Team Leader: _____ <<Review Team Leader>> / Date

II. Checked for Conformance with Internal Division Procedures by:

Division Safety Coordinator: _____ <<Division Safety Coordinator>> / Date

III. *Authorized by:*

Division Director: _____ <<Division Director>> / Date

EH&S Division Director: _____ Designee: Paul Blodgett / Date

☐ ***Division must forward a hard copy of the fully signed signature page and an electronic copy of the AHD to the AHD Coordinator, Larry McLouth, LDMcLouth@lbl.gov, Mailstop 75-R 0123***

Signatures of the Division Director and of EH&S confirm that an Operational Readiness Review has been completed and that work may begin

Renewal for Existing AHD To Which Either No or Minor Changes Were Made

This Activity Hazard Document and the work to which it applies have been reviewed, and (check one)

☐ *there are* ***no significant changes in hazard*** *and* ***no significant changes in the Activity Hazard Document.***

☐ *this AHD is inactive and work is not in progress.* ***Reactivation requires review by EH&S.***

I. Reviewed by:

Principal Investigator: _____ <<Principal Investigator>> / Date

II. Checked for Conformance with Internal Division Procedures by:

Division Safety Coordinator: _____ <<Division Safety Coordinator>> / Date

III. *Authorized by:*

Division Director: _____ <<Division Director>> / Date

Work may continue after reauthorization by the Division Director.

☐ ***Division must forward a hard copy of the fully signed signature page and an electronic copy of the AHD to the AHD Coordinator, Larry McLouth, LDMcLouth@lbl.gov Mailstop 75-R 0123***

9a) Activity Hazard Documents (AHDs)

- Thresholds for AHD:
  - class 3b and 4 lasers
  - flammable gases over 400 cubic feet at ATP
  - toxic compressed or liquefied gases
  - extremely reactive or explosive materials
  - extremely acutely toxic materials
  - glovebox work
  - High stored energy: pressure, vacuum or cryogen systems
- Renewed annually
- Updated immediately whenever work or people change
- Contacts: Carmen Ross (Administrative), Rick Kelly (Technical)
- Now on computer database (https://ehswprod.lbl.gov/AHD/login.aspx)

9b) Maintain Formal Authorizations

- **Biological Use Authorization** *(Institutional Biosafety Committee):* All work with pathogens (> RG-2) or their nucleic acid, or materials that may contain such pathogens (including animal tissues, primate cell lines, primate blood)
  - Registration required for *all* recombinant nucleic acid work
- **Human Subjects Approval** *(Committee for Protection of Human Subjects):* Any use of human samples, information or contact with humans for research purposes must be reviewed to protect rights of participants.
  - Reviewed and reapproved annually
- **Animal Experimental Use** *(Animal Welfare Regulatory Committee):* All work with vertebrate animals must be reviewed and approved
  - May apply even if only using samples of tissue from animals housed at another institution
  - Reviewed and reapproved annually

9c) Maintain Formal Authorizations

- **Radiological Work Authorization/Radiological Work Permit:**
  - Unsealed sources (radioactive materials).
- **Sealed Source Authorization:**
  - Sealed sources
- **X-Ray authorization:** Most x-ray machines
  - XRD equipment, other x-ray machines
  - Not applicable to
    - Low power systems (e.g. XPS)
    - Accidental x-rays source (electrons in a vacuum)

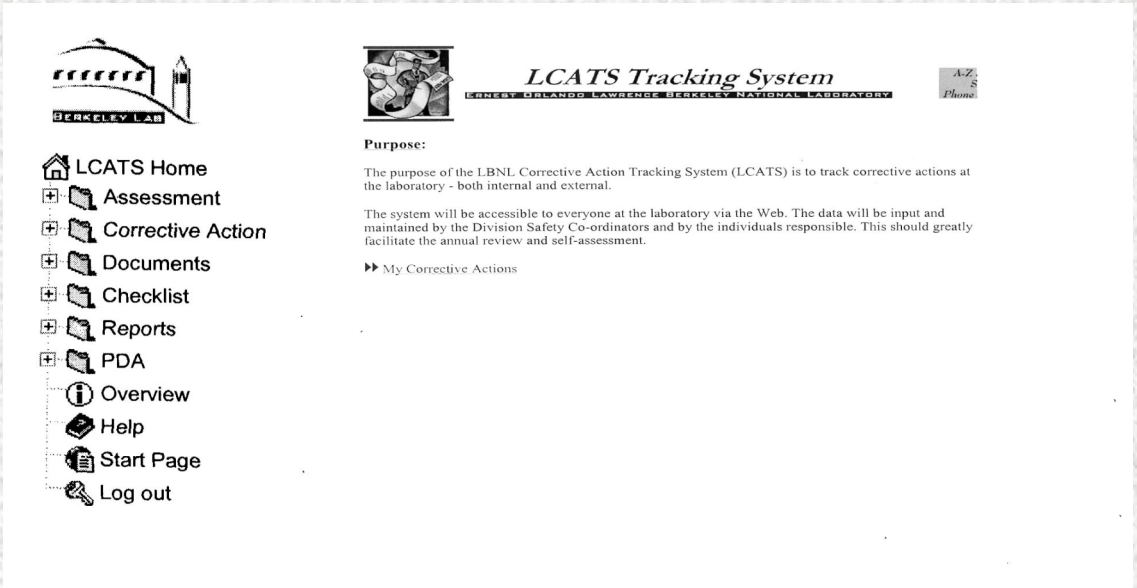
10) Resolve EH&S Issues Promptly

Identified problems that can not be immediately fixed should be reported to Rick Kelly, who will enter the issue in LBNL Corrective Action Tracking System (CATS).

- Review CATS to identify corrective actions assigned to your group
- Notify Rick Kelly when corrections are complete, he will verify the correction and close the record in CATS
- Items not corrected by the due date must either be renegotiated or the Division office will arrange for corrections using the PIs project ID

Correction of safety problems in your lab are your responsibility!

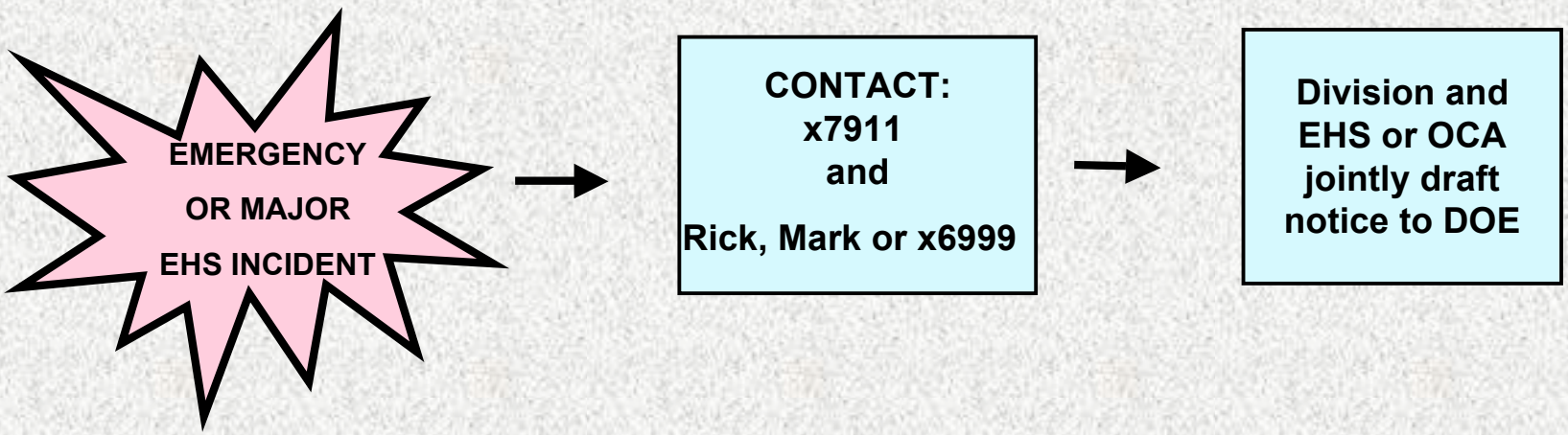
Technical assistance is available through Rick Kelly, Paul Johnson or EH&S.



11a) Responding to Incidents and Injuries

- Report all accidents, incidents and near misses to Rick Kelly and EH&S
- Be familiar with the Lab's incident reporting system

11d) Notification Summary for Major Incidents



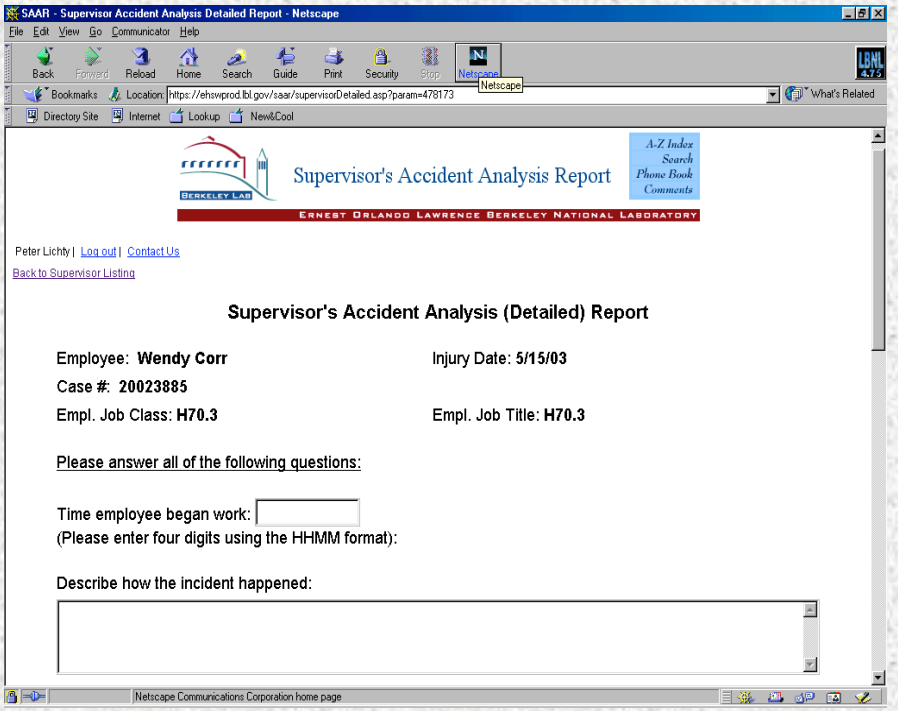
- In some cases, DOE rules impose a time limit on reporting incidents to the DOE that can be as short as 2 hours
- Contact RICK KELLY (x4088) **or** MARK ALPER (x6581) **or** EH&S directly:
  - Incident Notification/Contact, x6999

11b) An Injured Employee - Key Supervisor Responsibilities

- Medical Response
  - Minor Injury - Report to Health Services (small lacerations, i.e., anything more than a paper cut, to abrasions and contusions)
  - Major Injury - Call x7911, stabilize injured employee and control the scene
  - Bldg 48 (Fire House)– After hours/weekend or for medical transport (x7911 or x6015)
- Reporting
  - Supervisor Accident Analysis Report (SAAR) Process. Go to EHS website http://www.lbl.gov/ehs/index.shtml (Groups – Health Services – SAAR)

11c) Basic Requirements of Supervisors Accident Analysis Report (SAAR)

- Contact Rick Kelly if you receive an email from the SAAR System
- Submit completed SAAR within 2 days.
- Begin the Accident Investigation and participate in ongoing investigation:
  - Determine how the accident happened.
  - Identify the root cause(s).
  - Identify what could have prevented the accident (employee actions, manager actions and system changes).
  - Develop corrective actions to prevent a recurrence.



12) Serve as a Role Model

- Serve as a positive role model
- Establish a group culture where safety is viewed as an important and integral consideration in research activities
- Empower the designated group safety representatives to manage safety in your group

Challenges for Supervisors/Mentors of Students

- Student unfamiliar with mentor's lab/LBNL
- Short 'learning curve' for training and getting started
- Student's desire to prove her/himself – can lead to risk taking
- Students' notions of "invincibility":
  - Won't get hurt
  - Will recover immediately
  - Ergonomics? – you've got to be kidding!
- Students assigned to grad students, post docs, or others who are, themselves, new to the mentor's lab/LBNL

Ensuring Student Safety

Hold a 1:1 Student Orientation (*Appendix C-Student Orientation Checklist)

- Review scope of project/work.
- Guide student through Job Hazards Questionnaire (JHQ).
- Review JHQ training profile and assist with training enrollment.
- (i.e.: provide schedules, location, EHS training Website, etc.)
- Orient student to lab practices/attire, procedures, equipment, personal protective equipment and lab personnel (including trainers).
- Define what the student can and cannot do, with and without training.
- Provide Line of Sight supervision, when training is not complete.
- Introduce student to Division Safety Coordinator, Building manager and others who have safety roles.
- Provide documented On Job Training.

Summary

- Serve as a role model
- Communicate expectations
- Ensure training is complete
- Experimental evaluation
  - procedures
  - formal authorizations
  - equipment
- Perform inspections, track corrections
- Maintain chemical inventory
- Manage chemical waste
- Be prepared to respond to an accident

Materials Sciences Division Safety Resources

- Rick Kelly: Facility and EH&S Manager, Chair of MSD Safety Committee (x4088, 66-203, RJKelly@lbl.gov)
- Joel Ager: Deputy Chair of MSD Safety Committee, MSD representative to LBNL Safety Advisory Committee
- Paul Johnson: EH&S Technician
- Carmen Bates Ross: EH&S Administrator
- Building Managers
- Jim Severns: Electrical safety and electrical repair
- John Seabury: EH&S liaison
- Howard Hansen: Hazardous waste representative

Materials Sciences Division Safety Resources

MSD Safety Web site:

- Training videos
- Materials from Safety Committee meetings
- Division ISM plan
- MSD Safety Bulletins
- MSD Accident Reporter
- Safety assurance statement
- Inspection checklists
- *Currently being updated and revised*